

Application No. 09/773,106
Preliminary Amendment dated August 8, 2006
Reply to Office Action of May 9, 2006

REMARKS

Status Of Application

Claims 3-23 are pending in the application; the status of the claims is as follows:

Claims 3-9 are withdrawn from consideration.

Claims 10-16 are allowed.

Claims 17-23 are rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,101,294 to McCaffrey et al. ("McCaffrey") in view of U.S. Patent No. 6,507,519 B1 to Collins et al. ("Collins").

Claim 24 has been added.

Claim Amendments

Claim 17 has been amended and claim 24 has been added to more particularly point out and distinctly claim the subject matter of the invention. These changes do not introduce any new matter.

35 U.S.C. § 103(a) Rejection

The rejection of claims 17-23 under 35 U.S.C. § 103(a), as being unpatentable over McCaffrey in view of Collins, is respectfully traversed based on the following.

McCaffrey teaches to adjust a charge control voltage applied to an image sensor so as to increase the capacity of imager for accumulating photoelectric charge obtained through photoelectric conversion. The capacity is adjusted so that it does not become too small relative to the amount of light. For example, McCaffrey teaches to control the electrode voltage applied to a CCD so as to control the capacity of the "potential wells."

Specifically, the charge control voltage is reduced during a first portion of an integration period relative to the charge control voltage applied during a second portion of the integration period. The interval for which the charge control voltage is reduced is determined based on the brightness of a previous captured image. See column 3, line 25 to column 4, line 62.

By contrast, the invention of amended claim 17 employs logarithmic compression to increase the range with respect to data obtained through reception of light, and simply shifts the output level while keeping the data itself untouched. That is, whereas McCaffrey aims to "expand the light reception range", the claimed invention aims to "shift the output level of the obtained signal to wherever appropriate, while the light reception range is kept constant (wide)". Thus, the present invention functions in a different manner than McCaffrey.

Moreover, McCaffrey is directed towards techniques to prevent saturation of the imager while accumulating a photoelectric charge during photoelectric conversion, whereas the present invention, which is inherently capable of receiving a wider brightness range of thanks to logarithmic compression, has nothing to do with the problem of saturation. Rather, the present invention aims to obtain enhanced contrast in the image obtained. Thus, the present invention differs also in objectives and benefits from McCaffrey.

Furthermore, the present invention differs from McCaffrey structurally. Though McCaffrey does not disclose a specific circuit, it teaches that the charge capacity is adjusted by controlling the depleted region of the CCD according to a charge control voltage. This suggests that the adjustment is performed by varying a voltage applied to the photoelectric conversion element. In contrast, claim 17 requires that the bias voltage applied to a transistor connected to the photoelectric conversion element is controlled to shift the output of the transistor. That is, the target to which a control voltage is applied differs between in the present invention and in the cited references.

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As discussed above, the present invention differs from McCaffrey in all aspects of configuration, objectives, workings, and benefits.

Accordingly, it is respectfully requested that the rejection of claims 17-23 under 35 U.S.C. § 103(a) as being unpatentable over McCaffrey in view of Collins, be reconsidered and withdrawn.

CONCLUSION

Wherefore, in view of the foregoing amendments and remarks, this application is considered to be in condition for allowance, and an early reconsideration and a Notice of Allowance are earnestly solicited.

This Amendment does not increase the number of independent claims and increases the total number of claims by 1 from 21 to 22, but does not present any multiple dependency claims. Accordingly, a Response Transmittal and Fee Authorization form authorizing the amount of \$50.00 to be charged to Sidley Austin LLP Deposit Account No. 18-1260 is enclosed herewith in duplicate. However, if the Response Transmittal and Fee Authorization form is missing, insufficient, or otherwise inadequate, or if a fee, other than the issue fee, is required during the pendency of this application, please charge such fee to Sidley Austin LLP Deposit Account No. 18-1260.


If an extension of time is required to enable this document to be timely filed and there is no separate Petition for Extension of Time filed herewith, this document is to be construed as also constituting a Petition for Extension of Time Under 37 C.F.R. § 1.136(a) for a period of time sufficient to enable this document to be timely filed.

Any other fee required for such Petition for Extension of Time and any other fee required by this document pursuant to 37 C.F.R. §§ 1.16 and 1.17, other than the issue fee,

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and not submitted herewith should be charged to Sidley Austin LLP Deposit Account No. 18-1260. Any refund should be credited to the same account.

Respectfully submitted,

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